

## Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

### Listing of Claims:

Claim 1 (currently amended): A computerized method ~~Method~~ for regulation tree construction derived from an existing decision tree having the same structure as the existing decision tree in intelligent system applications to regulate the quality of the decision rules automatically comprising the following steps:

- (a) Means for inputting ~~Input~~ an existing decision tree;
- (b) Means for inputting ~~Input~~ a set of training samples;
- (c) Means for determining ~~Determine~~ distance-to-threshold statistics from the training samples for at least one non-terminal node and storing ~~store~~ in the decision tree structure;
- (d) Means for determining ~~Determine~~ likelihood value statistics from the training samples for at least one terminal node and storing ~~store~~ in the decision tree structure;
- (e) Means for selecting ~~Select~~ regulation parameters for adjustment between the crisp tree and the probabilistic tree and for weakening the likelihood values for terminal nodes having a small number of training samples.

Claims 2-4 (canceled)

Claim 5 (currently amended): A computerized regulation tree application method in intelligent system applications to regulate the quality of the decision rules automatically comprises the following steps:

- (a) Means for inputting ~~Input~~ a sample;

- (b) Means for determining ~~Determine~~ the likelihood values for at least one non-terminal node using the distance to threshold value for the input same and the probability density function for the at least one non-terminal node;
- (c) Means for determining ~~Determine~~ the likelihood value for a branch to at least one terminal node by multiplying the likelihood values of all non-terminal nodes in the branch;
- (d) Means for determining ~~Determine~~ the confidence value for at least one class by summing over all terminal nodes with their multiplication of non-terminal node branch likelihood values and the likelihood value for a class c at terminal node using the following formula:

$$Confidence_c(X_{input}) = \sum_{j \in \text{terminal\_nodes\_to\_j}} \prod_{s \in \text{branches\_to\_j}} L^s(X_{input}) L^j_{\text{class\_c}}$$

---

Claims 6-11 (canceled)

Claim 12 (currently amended): A computerized regulation tree non-terminal node update learning method in intelligent system applications to regulate the quality of the decision rules automatically comprises the following steps:

- (a) Means for inputting ~~Input~~ a training sample;
- (b) Means for inputting ~~Input~~ the true class of the training sample;
- (c) Means for classifying ~~Classify~~ the input training sample using a crisp decision method to determine its association with at least one non-terminal node;
- (d) Means for updating ~~Update~~ non-terminal node distance-to-threshold statistics using accumulated distance, accumulated weight and accumulated square distance.

Claim 13 (currently amended): The method of claim 12 wherein the non-terminal node distance-to-threshold statistics include weighted distance histogram mean distance and the distance standard deviation.

Claim 14 (currently amended): A computerized regulation tree update learning method for new classes in intelligent system applications to regulate the quality of the decision rules automatically comprises the following steps:

- (a) Means for performing ~~Perform~~ new regulation tree construction in addition to the original regulation tree to form a compound tree structure including multiple trees that are trained from an expanding training data base of old and new training samples. The first tree is the original regulation tree and the other trees correspond to new classes that are sequentially trained into the decision system through new class addition. Each added tree incorporates a new class;
- (b) Means for performing ~~Perform~~ a compound tree update wherein a sample from new class updates all trees except for the trees constructed before the class is introduced.

Claim 15-16 (canceled)

Claim 17 (currently amended): A computerized compound tree application method in intelligent system applications to regulate the quality of the decision rules automatically comprises the following steps:

- (a) Means for inputting ~~Input~~ a sample to be applied;
- (b) Means for applying ~~Apply~~ the sample to all trees;
- (c) Means for combining ~~Combine~~ the results from all trees wherein the resulting confidence value is calculated by the following steps:
  - (i) For a new class, the confidence value from the tree is used as the resulting confidence value;
  - (ii) For an old class, the confidence value from the tree multiplies 1 minus the confidence values from each of the newer classes is the resulting confidence value.

Claims 18-19 (canceled)

Claim 20 (currently amended): A computerized focusing tree construction method in intelligent system applications to regulate the quality of the decision rules automatically comprises the following steps:

- (a) Means for inputting ~~Input~~ a set of training samples;
- (b) Means for generating ~~Generate~~ a new weight for each training sample consisting of the following steps[[;]]:
  - (i) Determining the sample's discrimination merit using confidence ratio between the correct classification and the highest confidence value for an incorrect classification;
  - (ii) Deriving the sample's weight update factor using the sample's discrimination merit;
  - (iii) Generating the new weight for the sample using the weight update factor.
- (c) Means for generating ~~Generate~~ a new tree using the sample and the new weight.

Claim 21-24 (cancelled)